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Self-Fertilization, 418; Gard. Chron., Jan., 1880, 81; July, 1880, 110. Other references occur in the additional papers to which I have already referred, as well as in many of these.

#### EXPLANATION OF FIGURES.

1. Longitudinal section of the ovary of *Yucca filamentosa*, on the line A—B of the next figure,  $\times 2$ .
2. Cross section of the same, at about the middle,  $\times 6$ .
3. A portion of 2, at G,  $\times 200$ .

G, the nectar gland, opening at D into g, the conducting groove into which its secretion is poured and in which it passes to N, where it appears at the outside of the ovary.

Since the foregoing was written I have had an opportunity to observe *Y. angustifolia* in full bloom in the Ute Pass, north of Manitou, Col. The nectar glands of this species are about as in *Y. filamentosa*, and open and discharge their secretion similarly, but I have found the latter rather more abundant. The stigma of *Y. angustifolia* is rather larger, and very green, as contrasted with the white stigma of *Y. filamentosa*, and its secretion is more abundant, so that frequently a prominent drop is visible between its lobes. The pistil differs in that the stigmatic cavity is short and does not communicate with the ovarian cells, so far as can be seen with a three-fourth lens.

One or more species of *Pronuba* and *Prodonus* are met with in the flowers in considerable numbers. The opportunity has not offered for watching the former at night; but many of the flowers are pollinated, the abundant white pollen contrasting so strongly with the dark green stigma as to render its presence evident even to the naked eye. Scattering dried capsules on the stalks of last year and an abundant crop of this year's fruit attest the efficacy of this pollination, which could only have been effected by the moths in the flowers I refer to.

JULY 19, 1886.

#### Some Californian Polypetalæ.

BY E. L. GREENE..

STREPTANTHUS NIGER.—1 to 3 feet high, paniculately branching from near the base, glabrous and glaucous; leaves linear, 2 to 3 inches long, the lowest with narrow, divaricate,

gland-tipped lobes or teeth, those of the branches entire, all sagittate-clasping; racemes loose, flexuous, not secund; pedicels ascending, an inch long; calyx very dark purple, very smooth and shining; sepals ovate-cymbiform, with a thick, obtuse, but prominent nerve; petals consisting of a stout, thick, lanceolate purple claw and a minute, veinless, white lamina; upper pair of filaments united almost to the summit, their anthers small and rudimentary, not polliniferous; pod about 2 inches long, nearly straight on the ascending or suberect, long pedicels; seed with a very narrow wing.

Point Tiburon, Marin County, April and May, 1886; collected only by the writer. Related to *S. glandulosus*, but perfectly smooth and very glaucous; otherwise readily distinguishable by the very small lamina of the petals, and the short suberect, long-stalked pods, in a loose, equilateral raceme. The rather large, subglobose calyx is nearly black.

STREPTANTHUS PERAMÆNUS.—A foot or two high, pilose-hispid; leaves sinuately toothed and auriculate-clasping; racemes somewhat secund; calyx a half-inch long, deep magenta; sepals all ovate-cymbiform, sharply carinate, the lateral pair turned inward behind the upper petals, the apex of each meeting that of the other in front of the uppermost sepal; uppermost pair of filaments united above the middle, thence divergent, but their anthers reduced and sterile; each anther of the lowest pair held within the folds of the corresponding petal; upper pair of petals a third longer than the lower, limb of all white, with purple veins, somewhat conduplicate; pods 3 inches long, arcuate-spreading, on pedicels of less than a half-inch; seed narrowly winged.

Oakland Hills; collected many years ago by Mr. Bolander, and again this year, by the writer. A most beautiful species, with the habit and pubescence of *S. glandulosus*, to which it has been referred; but the living plant reveals at once the singular irregularity of the calyx above pointed out. The lowest sepal is left apart from the others, and the three form, as it were, a broad upper lip, the two lateral curving around the uppermost one and meeting point to point in front of it.

THELYPODIUM LASIOPHYLLUM.—*Turritis* (?) *lasiophylla*, Hook and Arn., Bot. Beech., 321; *Sisymbrium reflexum*, Nutt.,

Pl. Gamb., 183; Watson, Bot. Cal. i., 41; Greene, Bull. Cal. Acad. i., 221.

*Thelypodium neglectum*, Marcus F. Jones, Am. Nat. xvii., 875.—This exceedingly common Californian plant has always seemed to me entirely out of place in *Sisymbrium*. It is a coarse, stout herb, usually many times larger than our authors seem to know, often growing to the height of four or five feet, and when young its whole aspect as well as the flavor of its herbage are precisely those of several species of *Thelypodium* when in the same early state. And now, from the rare *T. flavescens* lately rediscovered near Antioch, by Mrs. Curran, I find it is only to be distinguished by its smaller flowers and fruit, and by its uncertain pubescence; I say uncertain, because the larger states of the plant are commonly quite glabrous; although in some of the forms there is a hairiness which extends even to the pods. Near the coast, at San Francisco and northwards, the plant is smaller, the stem quite simple and the pods pointless and erect. One would like to treat this as a distinct species, but there are larger intermediate states with pods spreading and even arcuate-recurved.

PHÆNICAULIS MENZIESII.—*Hesperis Menziesii*, Hook. Fl. Bor. Am., i., 60; Hook. and Arn., l. c., 322; *Cheiranthus Menziesii*, Benth. and Hook., Gen. i., 68; Watson, l. c., 35; *Phænicaulis cheiranthoides*, Nutt., in Torr. and Gray, Fl. N. Am. i., 89.

To us who are well acquainted with this unique looking Crucifer, no other opinion commends itself but that of Nuttall who, if he had not perceived it to be of a new generic type, would have referred it to *Pamya*, rather than to *Hesperis* or *Cheiranthus*. The flat ensiform pods are entirely foreign to both the genera last named, and the habit is in equally strong contrast with that of either. The deep, thick perennial roots are crowned by a distinct, often branching and partly subterranean caudex; and the flowering branches, whether called scapes or stems, are in reality only axillary, bracted peduncles. These are usually numerous, and always decumbent around the central tuft of leaves which terminates each branch of the caudex. Beyond this nothing is to be added to Nuttall's full and excellent description in Torrey and Gray, but his specific name must give place

to the earlier one imposed under *Hesperis* by Sir William Hooker.

CALYPTRIDIMUM PANICULATUM.—*Spraguea paniculata*, Kellogg., Proc. Cal. Acad., ii., 187, t. 56; Watson, l. c., 78; Curran, Bull. Cal. Acad. i., 132.

This plant, so fortunately rediscovered by Mrs. Curran two years ago, although long-styled like the original *Spraguea*, has the ultimately calyptriform corolla of the several species which have already been published under the Nuttalian generic name. By these circumstances and the close resemblance which it bears to both those species of *Calyptridium* which Mr. Watson has published, it appears utterly to invalidate the genus *Spraguea*; for genera cannot be rested on the mere length of styles and filaments, at least, when species are so perfectly one thing in habit, texture and properties. *Monocosmia*, the South American ally of these plants, while outwardly resembling them quite closely, appears well and strongly founded on its herbaceous, indehiscent, one-seeded capsule.

CALYPTRIDIMUM UMBELLATUM.—*Spraguea umbellata*, Torr. Pl. Frem., 4, t. i; Watson, l. c., 77; Hook., Bot. Mag. 5, 143.

#### Notes on *Marsilia quadrifolia*.

Near the obelisk in Washington, D. C., are a series of fish ponds used by the U. S. Fish Commission for German carp, etc. Four years ago, among various plants set out in order to ascertain their relations to fish culture, were *Marsilia quadrifolia* and *M. sylvatrix*, from Germany. The latter died out the next winter, but the former appears to have established itself, perhaps permanently, as specimens have been collected this year in various places remote from the point of introduction. This spreading cannot be due to artificial aid, as the first supply (a part of which came also from Texas), was rooted out and an effort made to destroy it entirely, as experience showed it useless, if not injurious to the fish.

I collected and placed a quantity of it in a large dish kept supplied with water, where it grows very thriftily and is rather pretty, so that it may prove an addition to our list of aquarium plants. The first editions of Gray's Manual do not contain this plant, which first appears in that of 1863, Addenda, collected by Dr. T. F. Allen in Bantam Lake, Litchfield, Conn. Also found